

## CLAIMS

What is claimed is:

1. A catalyst composition comprising a late transition metal held upon a support, wherein:  
  
the late transition metal is selected from the group consisting of Ru, Co, Ni, Pd, Pt, Cu, Ag and Au, and  
  
the support comprises a material of formula  $\text{Mo}_a\text{W}_{2-a}\text{C}_b\text{N}_{1-b}$  wherein  $0 < a \leq 2$  and  $0 \leq b \leq 1$ .
2. A composition according to claim 1, wherein the support comprises molybdenum carbide.
3. A composition according to claim 1, wherein the support comprises molybdenum nitride.
4. A composition according to claim 1, wherein the late transition metal comprises platinum.
5. A composition according to claim 1, wherein the late transition metal comprises nickel.
6. A composition according to claim 1, wherein the late transition metal comprises gold.

7. A composition according to claim 1, wherein the catalytic composition comprises 0.1-10 % by weight of the late transition metal.
8. A composition according to claim 7, comprising 0.5-5% by weight of the late transition metal.
9. A composition according to claim 7, comprising 1.0-4% by weight of the late transition metal.
10. A catalyst composition comprising a late transition metal carried on a support, wherein
  - the transition metal is selected from the group consisting of Ru, Co, Ni, Pd, Pt, Cu, Ag and Au;
  - the support comprises molybdenum carbide or molybdenum nitride, and
  - the catalyst composition comprises 0.1-10% by weight of the transition metal.
11. A composition according to claim 10, wherein the support comprises molybdenum carbide.
12. A composition according to claim 10, wherein the support comprises molybdenum nitride.

13. A composition according to claim 10, wherein the transition metal is selected from the group consisting of platinum, nickel and gold.
14. A method for carrying out a water gas shift reaction, comprising contacting a gaseous stream comprising carbon monoxide and water with a solid catalyst comprising a late transition metal carried on a support, wherein the support comprises a carbide or nitride of molybdenum; and wherein the late transition metal is selected from the group consisting of Ru, Co, Ni, Pd, Pt, Cu, Ag, and Au.
15. A method according to claim 14, wherein the gas stream is contacted with the solid catalyst at a temperature of from 200-240°C.
16. A method according to claim 14, wherein the solid catalyst further comprises silica.
17. A method according to claim 14, wherein the late transition metal is selected from the group consisting of nickel, platinum and gold.
18. A method according to claim 14, wherein the support comprises Mo<sub>2</sub>C.
19. A method according to claim 14, wherein the late transition metal comprises a metal selected from the group consisting of nickel, platinum and gold.

20. A method according to claim 14, wherein the solid catalyst comprises 0.1-10% by weight of the late transition metal.

21. A method according to claim 14, wherein the solid catalyst comprises 0.5-5% by weight of the late transition metal.

22. A method of preparing a supported transition metal composition comprising the steps of:

bringing a solid group 6 metal carbide or nitride into contact with an

aqueous solution of a late transition metal to form a system

comprising solids and the supernatant;

separating the solids from the supernatant;

drying the solids; and

heating the solids above 200°C to produce a catalyst composition

comprising the late transition metal on the group 6 metal carbide or

nitride,

wherein the group 6 metal comprises molybdenum or tungsten and the late

transition metal comprises Ru, Co, Ni, Pd, Pt, Cu, Ag, or Au.

23. A method according to claim 22, further comprising raising the pH of the supernatant while in contact with the solids.

24. A method according to claim 23, wherein raising the pH of the supernatant comprises adding carbonate salts.
25. A method according to claim 22, wherein the group 6 metal carbide or nitride comprises molybdenum carbide.
26. A method according to claim 22, wherein the late transition metal comprises platinum, nickel or gold.
27. A method according to claim 22, comprising heating the solids above 400°C.
28. A method according to claim 22, further comprising passivating the composition by exposing it to oxygen.
29. A method according to claim 22, wherein the steps are carried out in the absence of oxygen.